



ORIGINAL ARTICLE

Workforce challenges across Victorian medical oncology services

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Key words

health workforce, medical oncology, healthcare benchmarking.

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Received 26 August 2022; accepted 13 December 2022.

Abstract

Background: Cancer incidence is growing, with increasing treatment options and durations. This has led to an increase workload on the current oncology workforce. The global pandemic has increased this pressure further.

Aims: To determine the current medical oncology workforce in Victoria, current shortfalls and future anticipated shortfalls beyond the COVID-19 pandemic.

Methods: A self-reported, cross-sectional observational study of all current adult Victorian cancer services in June 2020 examining workforce, workload and early effects of the COVID-19 pandemic.

Results: The current average workload of 242 new patients per full-time equivalent consultant in medical oncology across Victoria. This is higher than optimal to deliver a safe and efficient cancer service. The significant variation in workforce between sites highlights the areas in need of most urgent resource allocation. Use of safe prescribing practises such as electronic chemotherapy prescribing are not universal but urgently needed.

Conclusions: The medical oncology workforce in Victoria is inadequate to meet current and future demands. This needs to be addressed urgently to avoid an adverse impact on cancer measures and quality standards. Better, standardised data collection is needed to allow for ongoing measures of workforce activity. Novel workforce solutions will also need to be implemented in the short and medium term in the face of global workforce shortages.

Introduction

The global coronavirus disease 2019 (COVID-19) pandemic has adversely impacted medical services internationally and cancer services in particular.^{1,2} In the state of Victoria, prolonged COVID-19 restrictions in 2020 were accompanied by a 10% reduction in cancer pathology notifications³ and led to concerns of a postpandemic surge in cancer diagnoses. The number of missing cancer diagnoses has continued to accumulate to more than 4000 cases not yet diagnosed.³

The number of cancer patients taking active systemic therapy is rising rapidly overall⁴ due to improvements in survival outcomes⁵ and longer duration of treatment.⁶

An ageing population and decreased mortality from other causes such as cardiovascular disease has resulted in an increasing incidence of cancer of nearly 3% per year in Victoria.⁷ Furthermore, in an era of genomic data-driven treatment, cancer care is becoming increasingly complex, with greater time required to maintain professional expertise; a US study reported a median of 4.6 h per week spent on professional development.⁸ European data suggest that the medical oncology workforce is increasing at approximately 5% over 12 years from 2000⁹ and is not projected to meet increases in demand in the US either.¹⁰

Several studies have examined metrics of the oncology workforce in Australia¹¹ and New Zealand,¹² as well as international studies in countries of varying income levels.¹³ While no single metric can capture the extent of

Conflict of interest: None.

workforce activity needs including inpatient consultations, multidisciplinary meetings, professional development and so on, some, such as *annual new consultations per oncologist*, allow for international comparisons.

As part of the Victorian State government's response to the COVID-19 pandemic, a network of cancer clinicians, the Victorian Cancer COVID-19 Network (VCCN), was established, facilitated by the Victorian Comprehensive Cancer Centre Alliance (VCCC) and Monash Partners Comprehensive Cancer Consortium (MPCCC).¹⁴ This network facilitated new models of care in the cancer sector in response to the pandemic¹⁵ but may have an enduring role. All 18 medical oncology services across regional and metropolitan Victoria were included.

To determine current medical oncology workforce capacity in Victoria, a cross-sectional observational study was conducted in mid-June 2020 of the clinical directors group of the VCCN, similar to previously published workforce surveys.¹¹

Methods

A lead clinician or clinical director of cancer services was identified at all 18 public and private sites in Victoria providing adult medical oncology services. These lead clinicians were invited to be part of the VCCN clinical directors group. They were invited to complete a 38-question self-administered survey of current workforce levels in oncology and early effects of the COVID-19 pandemic on workflow.

These survey questions were based on similar, previously published workforce surveys in Australia.¹¹ The survey included details of the clinicians' current practice, the practice setting (public, private or mixed), and the self-defined area of practice (inner metropolitan, outer metropolitan or regional). For the purposes of this analysis, one site at Barwon Health in Geelong nominated itself to be regional. According to the Modified Monash System and Australian Statistical Geography Standard-Remoteness Areas 2011,¹⁶ central Geelong is considered metropolitan but most of its suburbs/catchment areas are classified as regional.

Respondents were asked about the total number of patients seen in the outpatient setting in each service in a single calendar year (2019), the number of new patients seen, the number of full-time equivalent (FTE) medical oncologists (MOs) including unfilled FTE, the number of MOs expected to retire in the next 5 years and the number of advanced trainees (ATs). Although ATs have not completed their training, they are highly skilled physicians and are often an essential part of service delivery, as well as an indicator of future MO numbers.

Respondents were asked about other specialist staff, including care co-ordinators or patient navigators, electronic medical records (EMRs) and electronic chemotherapy prescribing modules. The number of clinical trial staff, including trial fellows, as well as the number of trials open in the pre-pandemic setting was sought to define clinical trial activity. They were asked about the number and volume of satellite site services, the number of multidisciplinary team meetings (MDTs) at the site. Finally, the lead clinicians answered questions on the impact of COVID-19 on cancer services in mid-2020.

Lead clinicians were initially sent a link to an online survey, with a follow-up reminder verbally during online meetings, via email and ultimately via phone to ensure completion of the survey.

Descriptive statistics were used to summarise the responses received to the survey. Workforce results were aggregated by area (inner, outer metro and regional) to avoid identifying sites. All calculations excluded missing data where certain data were unavailable for several sites.

Results

All services completed the survey. Two sites were unable to provide complete data on patient numbers, and these sites were excluded from the analysis of that question. Of the 18 services, three identified as private practice, 13 as public and two as a mixed public/private model. Six identified their location as inner metropolitan, six as outer metropolitan and seven as regional.

Current workforce levels

Across Victoria, approximately 31 700 new cancer patients were seen by medical oncology services in 2019, with a mean of 1764 per site and a range of 263 to 5000 new cases (Table 1). This was highest in inner metropolitan centres (mean 2350) compared with outer metropolitan (mean 1853) and regional (mean 1104) centres. Those in private or mixed public-private practice saw, on average, more new cases than their public counterparts. These new patient consultations accounted for 12% to 16% of all outpatient consultations with similar levels across all groups. The medical oncology FTE across the state was 131, with a wide variation in mean FTE per site across settings. Unfilled FTE accounted for only a small portion of current workforce allocations (0.3 FTE unfilled at time of the survey).

The mean number of new patients per FTE, a common benchmark of medical workforce levels, was 243, ranging from 120 to 621. Historically this benchmark has been set at 150 to 180,⁴ and most sites were higher than this.

Table 1 Patient volumes in calendar year 2019

	Overall (N = 18)	Inner metropolitan (n = 6)	Outer metropolitan (n = 5)	Regional (n = 7)	Public (n = 13)	Private/mixed (n = 5)
Mean NP per site (range)	1764 (263–5000)	2350 (650–5000)	1853 (263–3900)	1104 (529–2400)	1615 (263–3900)	2149 (529–5000)
Mean outpatient consultations [†] (range)	10 298 (3116–31 492)	15 379 (5627–31 492)	13 580 (5000–25 000)	8536 (3116–12 870)	11 802 (3600–31 492)	6901 (3116–11 962)
Total number (MO)	131	76	28	28	80	52
Mean MO per site	7.26	12.6	5.43	3.94	6.1	1
Unfilled FTE MO	0.3	0	0.1	0.2	0.3	0
Number of NP per MO FTE	243	194	337	280	265	208
Total number of AT FTE	47.5	24.5	12	10	34	13.5
Mean NP per AT FTE	669	602	772	773	617	796

Rounding of data to whole numbers for ease of comprehension has meant some data do not match total numbers. AT, advanced trainee; FTE, full-time equivalent; MO, medical oncologist; NP, new patient consultations.

[†]Two sites were unable to answer and were excluded from analysis in this question.

Higher mean levels were seen in outer Metropolitan centres (mean 337 per FTE), with regional sites seeing 280 per FTE and inner Metropolitan centres seeing 194 per FTE (Table 1).

While the number of ATs has increased greatly in recent years, to a total of 47.5 positions, this varies from 24.5 in inner metropolitan to 10 and 12 in regional and outer metropolitan centres respectively. The distribution of these trainees also varies by site size, with a mean of 669 new patients per AT across all sites, but 772 and 773 in regional and outer metropolitan, respectively, compared with 602 in inner metropolitan centres.

COVID-19-related questions

All 18 clinicians were asked about changes to the workforce during the COVID-19 pandemic, including a reduction in junior medical staff (19% of respondents reported a reduction in available workforce) and nursing staff redeployment (19%). ‘Later presentation of new patients’, something that is difficult to measure without data on stage at presentation, was reported by 52% (11 of 21), an ongoing and concerning trend, with emerging evidence of reduction in cancer registrations in Victoria and across the world.⁴ Most reported moving to working online, with implementation of telehealth (95%) and virtual MDTs (95%). A total of 71% felt there was a negative impact on their professional training. Changes in the delivery of cancer care were also noted, with increased use of oncology in the home (38%), increased use of nurse-led clinics to support patients taking systemic anticancer treatment (especially Symptom Urgent Review Clinics, 71%). Eleven of the 18 units reported COVID-related alterations in treatment regimens. Of the services that provided outreach clinics, nine of 11 (82%) maintained those services. In terms of the day-to-day management of patients, 81% reported managing COVID-19 positive or suspected positive patients on specific COVID-19 wards and 71% reported some medical staff needing to self-isolate because of exposure to COVID-19 cases. With an anticipated surge in new cancer diagnoses post-COVID-19 shutdown, clinicians were asked whether they had the resources to manage an increased workload, and only 48% felt they had. No data were collected around these COVID-related changes at the time.

Discussion

International benchmarks of an individual MO seeing 150 to 180 new patients *per annum* in high-income countries were based on activity from the 1990s and

published over 20 years ago.¹⁷ These targets may be less relevant today given the significant improvement in patient survival, increased time on treatment and increased complexity of systemic therapy for advanced cancers. Blinman *et al.* reported activity levels of 270 new consultations per oncologist in 2012 in Australia,¹¹ Bidwell *et al.* reported 220 in 2013 in New Zealand,¹² while Fundytus *et al.* reported a median of 175 in high-income countries worldwide including Canada.¹³ Seruga *et al.* reported European levels, with a median of 225 in Eastern Europe and 175 in Western Europe in 2017.¹⁸ Our findings of 243 new patients per FTE are consistent with previous Australian reports, and remain outside published benchmarks, but of particular note was the finding of outer metropolitan and regional working well outside benchmarks (337 and 280 per FTE, respectively).

The historical benchmark of 150 to 180 new cancer patients per FTE was developed in the era where most patients received a limited number of cycles of chemotherapy and second-line treatment for many tumours was not possible. The rapid evolution of systemic therapies in the past decade, including immunotherapy and targeted therapies, has enabled more patients to access treatments for a greater amount of time. While there has been an increase in oncologists compared with 2009 (131 vs 68 FTE), this has been counteracted by the rapid increase in workload (31 700 new patients registered across Victorian sites in 2019). Much of this increase in FTE has occurred in the Victorian regional cancer centres. In the previous survey, there were only four FTE in regional Victoria, and there are now 27.6 FTE.¹¹

Currently, the median duration, number of lines of therapy and complexity of systemic cancer therapy is vastly different from 20 years ago. Additionally, community and professional expectations of shared decision-making have increased the time per patient interaction. The introduction of electronic systems and systems-level service improvements are likely to have improved support for the medical oncology workforce; however, this FTE-based benchmark may no longer be acceptable today.

Over recent years there have been improvements in work productivity, helped by information technology such as EMRs and electronic chemotherapy prescribing systems. These have a role in medication safety and make delivery of services in the outreach setting safer.¹⁹ Of significant concerns is that five of the services surveyed did not have e-prescribing for chemotherapy, and seven did not have an EMR. The units without e-prescribing are among the busiest in the state and rely on handwritten chemotherapy orders. A time-pressured workforce may lead to an increase in prescribing errors, while e-prescribing can reduce the risk of medication errors.²⁰

Greater involvement of the multidisciplinary team, with advanced nurse practitioners, care coordinators, allied health staff and other cancer professionals, has enhanced cancer services.²¹ The distribution of these resources is highly variable between sites, particularly between metropolitan and regional, and a more uniform approach will ensure more equity of care for patients.

Similarly, there has been an increase in the oncology trainee workforce, which is crucial for future workforce planning. Again, however, the distribution of trainee positions highlights a gap between services. One challenge in regional areas is in recruiting and retaining a specialist workforce, which may be improved by having increased trainees' experience of high-quality regional services during their training. Despite the growing need for a larger workforce, concerns regarding future career prospects are common, with 93% of trainees and 52% of early career oncologists concerned about limited numbers of new consultant positions in the future in one Australian study.²² If current trainees see no future increase in permanent positions, this will discourage future trainees from entering oncology training, inflating future workforce problems.

One of the weaknesses of this study is the self-reported survey nature of workload volume and workforce FTE. Some sites reported having difficulties in collecting basic activity data such as the number of new patients. This lack of data represents a major challenge to improving workforce across the state, as future planning is dependent on data analytics. The absence of any centralised, standardised reporting of activity across the state and the health system is a major failing in this era of real-time data and analytics to drive service improvement. The high response rate highlights the importance of these data to the clinicians involved.

Possible ways to address these identified shortfalls may include the urgent expansion of funded medical oncology positions in centres working above benchmarks; work to define acceptable workforce benchmarks based on contemporary models of care; expansion of services outside of the hospital setting, i.e., chemotherapy in the home/hub; urgent funding of e-prescribing for safer chemotherapy delivery; implementation of a state-wide data system to monitor workloads on a prospective basis, allowing services to recognise and respond to workforce pressure; an increase in the ability to retain a workforce in areas of need with funded academic opportunities and an increased use of nurse practitioners and other allied health roles in the oncology workforce.

Our focus since 2020 was to respond to an evolving COVID-19 pandemic. We believe that we are not well placed to cope with a postpandemic surge in cancer cases, nor ongoing rising cancer cases in the years ahead. In 1999 the World Health Organization declared a cancer

pandemic that would result in year-on-year increases in cancer workload until at least mid-century and has since published a global call to action.²³

We need to continue to invest in cancer infrastructure and workforce, especially in underserved communities, to manage this disease, which continues to be the leading cause of death²⁴ and the biggest burden of disease in our communities.

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Supporting Information

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Appendix S1. Supporting Information.